

SEQUENCE LISTING

<110> REPKE, HEINRICH
 BUDDE, ECKHARD
 NICOLAUS, STEFAN

<120> PROTEIN HAVING MULTIPLE ANTIGEN/EPITOPE SEQUENCES AND
 BEING IMMOBILIZED

<130> ALBRE-22

<140> 10/059,271

<141> 2002-01-31

<150> DE 101 06 295

<151> 2001-02-02

<160> 97

<170> PatentIn Ver. 2.1

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 peptide

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<222> (4)..(5)

<223> Any amino acid

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<222> (13)..(14)

<223> Any amino acid

<400> 1

Gly Lys Arg Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg Arg
 1 5 10 15

Gly



<210> 2
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<220>
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<400> 2
 Gly Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys
 1 5 10 15

Lys Xaa Gly

<210> 3
 <211> 22
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<400> 3
 Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Lys Xaa Lys Arg Lys Xaa
 1 5 10 15

Lys Xaa Xaa Cys Xaa Gly
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<210> 4
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 peptide

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<400> 4

Gly	Val	Ala	Xaa	Xaa	Lys	Xaa	Lys	Arg	Arg	Xaa	Xaa	Xaa	Arg	Glu	Lys
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Arg	Ala	Val	Gly
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<400> 5

Trp	Ile	Gln	Leu	Gln	Gln	Arg	Leu	Asn	Leu	Trp	Gly	Cys	Arg	Gly	Lys
1				5					10					15	

Leu	Ile	Cys	Tyr	Thr	Asn
					20

<210> 6

<211> 22

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<400> 6

Trp	Ile	Gln	Asn	Gln	Gln	Leu	Leu	Asn	Leu	Trp	Gly	Cys	Lys	Gly	Arg
1				5					10					15	

Leu	Val	Cys	Tyr	Thr	Asn
					20

<210> 7

<211> 22

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 peptide

<400> 7
 Trp Leu Gln Asn Gln Gln Ile Leu Asn Leu Trp Gly Cys Lys Gly Arg
 1 5 10 15
 Leu Ile Cys Tyr Thr Asn
 20

<210> 8
 <211> 22
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<400> 8
 Trp Leu Gln Ser Gln Gln Leu Leu Ser Asn Trp Gly Cys Arg Gly Lys
 1 5 10 15
 Leu Val Cys Tyr Thr Asn
 20

<210> 9
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<400> 9
 Ala Ile Glu Arg Tyr Leu Gln Asp Gln Ala Arg Leu Asn Ser Trp Gly
 1 5 10 15
 Cys Thr Phe Arg Gln Val Cys His
 20

<210> 10
 <211> 24
 <212> PRT
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<220>
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<400> 10
 Ala Met Glu Lys Tyr Leu Arg Asp Gln Ala Ile Val Asn Ser Trp Gly
 1 5 10 15

Cys Ala Phe Arg Gln Val Cys Tyr
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<210> 11
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 <212> PRT
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<220>
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 peptide

<400> 11
 Ala Met Glu Lys Tyr Leu Lys Asp Gln Ala Arg Leu Asn Ser Trp Gly
 1 5 10 15

Cys Ala Phe Arg Gln Val Cys His
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<210> 12
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 peptide

<400> 12
 Ala Ile Glu Lys Tyr Leu Lys His Gln Ala Gln Leu Asn Ala Trp Gly
 1 5 10 15

Cys Ala Phe Arg Gln Val Cys His
 20

<210> 13
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 peptide

<400> 13
 Thr Arg Lys Ser Ile His Ile Gly Pro Gly Gln Ala Phe Tyr Ala Thr
 1 5 10 15

Gly Asp

<210> 14
 <211> 18
 <212> PRT
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<220>
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 peptide

<400> 14
 Thr Arg Arg Ser Ile Ser Phe Gly Ile Gly Pro Gly Gln Ala Leu Tyr
 1 5 10 15

Thr Thr

<210> 15
 <211> 19
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<220>
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 peptide

<400> 15
 Thr Arg Gln Arg Thr Pro Ile Gly Leu Gly Gln Ala Leu Tyr Thr Thr
 1 5 10 15

Gly Gln Phe

<210> 16
 <211> 18
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<220>
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 peptide

<400> 16
 Arg Thr Val Gln Glu Ile Arg Ile Gly Pro Met Ala Trp Tyr Ser Met
 1 5 10 15

Gly Ala

<210> 17
 <211> 18
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<220>
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 peptide

<400> 17

Thr Met Lys Arg Thr Ser Ile His Ile Gly Pro Gly Gln Thr Phe Tyr
 1 5 10 15

Ala Thr

<210> 18

<211> 17

<212> PRT

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<220>

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 peptide

<400> 18

Thr Arg Arg Gly Ile Pro Leu Gly Pro Gly Arg Ala Trp Tyr Ala Thr
 1 5 10 15

Leu

<210> 19

<211> 19

<212> PRT

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 peptide

<400> 19

Asp Ser Thr Arg Glu Ser Met Arg Ile Gly Pro Gly Gln Ala Phe Tyr
 1 5 10 15

Ala Thr Gly

<210> 20

<211> 17

<212> PRT

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 peptide

<400> 20

Ile Arg Gln Gly Ile His Ile Gly Pro Gly Arg Ala Phe Phe Ala Ala
 1 5 10 15

Trp

<210> 21

<211> 16

<212> PRT
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<220>
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 peptide

<400> 21
 Asp Val Gln Glu Met Arg Ile Gly Pro Met Ala Trp Tyr Ser Met Gly
 1 5 10 15

<210> 22
 <211> 20
 <212> PRT
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<220>
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 peptide

<400> 22
 Ile Cys Thr Arg Arg Gly Ile Arg Met Gly Pro Gly Gln Val Val Tyr
 1 5 10 15

Ala Thr Cys Thr
 20

<210> 23
 <211> 18
 <212> PRT
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<220>
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 peptide

<400> 23
 Thr Ile Val Gln Ile Lys Ile Ile Gly Pro Leu Ala Val Tyr Ser Met
 1 5 10 15

Tyr Gly

<210> 24
 <211> 16
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<400> 24
 Thr Arg Lys Ser Val Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala Thr
 1 5 10 15

<210> 25
 <211> 18
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<400> 25
 Gly His Thr Arg Lys Ser Ile Arg Ile Gly Pro Gly Gln Thr Phe Tyr
 1 5 10 15

Ala Thr

<210> 26
 <211> 19
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<220>
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 peptide

<400> 26
 Asn Thr Arg Gln Ser Thr His Ile Gly Pro Gly Ala Leu Tyr Thr Thr
 1 5 10 15

Lys Ile Glu

<210> 27
 <211> 18
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<220>
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 peptide

<400> 27
 Thr Arg Lys Ser Ile His Leu Gly Pro Gly Gln Ala Phe Tyr Ala Thr
 1 5 10 15

Gly Asp

<210> 28
 <211> 20
 <212> PRT
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<220>
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 peptide

<400> 28

Tyr	Gln	Thr	Arg	Lys	Ser	Ile	Arg	Ile	Gly	Pro	Gly	Gln	Ala	Phe	Tyr
1				5					10					15	

Ala Thr Gly Asp
20

<210> 29

<211> 18

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 29

Thr	Val	Gln	Glu	Ile	Arg	Ile	Gly	Pro	Met	Ala	Trp	Tyr	Ser	Met	Gly
1				5				10						15	

Asn Val

<210> 30

<211> 16

<212> PRT

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 30

Thr	Arg	Ile	Ser	His	Thr	Ile	Gly	Pro	Gly	Arg	Val	Phe	Tyr	Arg	Thr
1				5				10						15	

<210> 31

<211> 18

<212> PRT

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<400> 31

Thr	Arg	Lys	Gly	Ile	His	Met	Gly	Pro	Gly	Gln	Val	Leu	Tyr	Ala	Thr
1				5				10						15	

Lys Pro

<210> 32

<211> 18

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<400> 32

His Thr Arg Lys Ser Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Ala
 1 5 10 15

Thr Ser

<210> 33

<211> 19

<212> PRT

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 33

Thr Arg Lys Ser Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr
 1 5 10 15

Ser Met Gln

<210> 34

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

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<400> 34

Gln Thr Arg Thr Ser Ile Thr Ile Gly Pro Gly Gln Val Phe Tyr Arg
 1 5 10 15

Thr Glu

<210> 35

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 35

Gly Thr Arg Lys Ser Val Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala
 1 5 10 15

Thr Gly

<210> 36
 <211> 17
 <212> PRT
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<220>
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 peptide

<400> 36
 Thr Arg Lys Gly Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr
 1 5 10 15

Gly

<210> 37
 <211> 14
 <212> PRT
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<220>
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 peptide

<400> 37
 Ala Val Gly Ile Gly Ile Asn Cys Thr Arg Pro Asn Asn Asn
 1 5 10

<210> 38
 <211> 19
 <212> PRT
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<220>
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 peptide

<400> 38
 Gly Asp Ile Ile Gly Asp Ile Arg Gln Ala His Cys Asn Ile Gly Pro
 1 5 10 15

Thr Pro Thr

<210> 39
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
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 peptide

<400> 39

Gly Lys Arg Ala His Lys Ser Arg Lys His Asn Tyr Lys Arg His Ile
 1 5 10 15

Arg Arg Gly

<210> 40

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 40

Gly Ser Lys Lys Ala Arg Arg Ile Lys Gly Lys Met Arg Arg Leu Lys
 1 5 10 15

Lys Val Gly

<210> 41

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 41

Gly Val Cys Ile Lys His Arg Tyr Lys Arg Lys Asp Lys Arg Lys His
 1 5 10 15

Lys Val Ala Cys Ile Gly
 20

<210> 42

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 42

atatggcata tgtttttaga tggaatagat aaggccc

37

<210> 43

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 43

tatagggccc aggtggcagg ttaaaa

26

<210> 44

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 44

atatggcata tgtttttaga tggaatagat aaggccc

37

<210> 45

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 45

tttttagatg gaatagataa ggccaagat gaacatgaga aatatcacag taattggaga 60

<210> 46

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 46

Met Phe Leu Asp Gly Ile Asp Lys Ala Gln Asp Glu His Glu Lys Tyr
1 5 10 15His Ser Asn Trp Arg
20

<210> 47

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220>

<221> CDS

<222> (1)..(30)

<400> 47

gca atg gct agt gat ttt aac ctg cca cct
Ala Met Ala Ser Asp Phe Asn Leu Pro Pro
1 5 10

30

<210> 48

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 48

Ala Met Ala Ser Asp Phe Asn Leu Pro Pro
1 5 10

<210> 49

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 49

tatagggcc aggtggcagg ttaaaa

26

<210> 50

<211> 47

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 50

caaaaaggcc cgtcgcatca agggcaaaat gcgacgggtg aagaaag

47

<210> 51

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 51

ccggcctttct tcacccgctcg cattttgccc ttgatgcgac gggccttttt gggcc 55

<210> 52

<211> 47

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 52

caaaaaggcc cgtcgcatca agggcaaaat gcgacgggtg aagaaag 47

<210> 53

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 53

Gly	Pro	Lys	Lys	Ala	Arg	Arg	Ile	Lys	Gly	Lys	Met	Arg	Arg	Val	Lys
1				5					10					15	

Lys Ala Gly

<210> 54

<211> 55

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 54

ccggcctttct tcacccgctcg cattttgccc ttgatgcgac gggccttttt gggcc 55

<210> 55

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 55

taatttgccg gcgtagtagc aaaagaaata gtag

34

<210> 56

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 56

tatagcatgc tccatatgct gtttcctgcc ctgt

34

<210> 57

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 57

taatttgccg gcgtagtagc aaaagaaata gtag

34

<210> 58

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 58

gtagtagcaa aagaaatagt agccagctgt gataaatgtc agctaaaagg agaagccatg 60

<210> 59

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 59
 Ala Gly Val Val Ala Lys Glu Ile Val Ala Ser Cys Asp Lys Cys Gln
 1 5 10 15

Leu Lys Gly Glu Ala Met
 20

<210> 60
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<220>
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 <222> (1)..(60)

<400> 60
 cat gga caa gta gac tgt agt cca gga ata tgg caa cta gat tgt aca 48
 His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr
 1 5 10 15

cat tta gaa gga 60
 His Leu Glu Gly
 20

<210> 61
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 61
 His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr
 1 5 10 15

His Leu Glu Gly
 20

<210> 62
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
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<220>

<221> CDS

<222> (1)..(60)

<400> 62

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aaa gtt atc ctg gta gca gtt cat gta gcc agt gga tat ata gaa gca 48
Lys Val Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu Ala
  1             5             10             15

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gaa gtt att cca
Glu Val Ile Pro
      20

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60

<210> 63

<211> 20

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 63

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Lys Val Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu Ala
  1             5             10             15

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Glu Val Ile Pro
      20

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<210> 64

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 64

gcagaaacag ggcaggaaac agcatat

27

<210> 65

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 65

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Ala Glu Thr Gly Gln Glu Thr Ala Tyr Gly Ala Cys
  1             5             10

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<210> 66
 <211> 34
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<220>
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 oligonucleotide

<400> 66
 tatagcatgc tccatgatgc gtttcctgcc ctgt 34

<210> 67
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 67
 catgcatcaa acaccgctac aagcgacgcg atcgtcggaa gcataaagtg gcctgc 56

<210> 68
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>
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 oligonucleotide

<400> 68
 ctaggcaggc cactttatgc ttccgacgat cgcgtcgctt gtagcgggtg ttgatg 56

<210> 69
 <211> 56
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 69
 catgcatcaa acaccgctac aagcgacgcg atcgtcggaa gcataaagtg gcctgc 56

<210> 70
 <211> 21
 <212> PRT
 <213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 70

Ala	Cys	Ile	Lys	His	Arg	Tyr	Lys	Arg	Arg	Asp	Arg	Arg	Lys	His	Lys
1				5				10					15		

Val	Ala	Cys	Ile	Gly
				20

<210> 71

<211> 56

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 71

ctaggcaggc cactttatgc ttccgacgat cgcgtcgctt gtagcgggtg ttgatg 56

<210> 72

<211> 33

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 72

attatcctag gtcaaattggc agtatctatc cac 33

<210> 73

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 73

tataggatcc taatcctcat cctgtctact tgc 33

<210> 74

<211> 33

<212> DNA

<213> Artificial Sequence

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oligonucleotide

<400> 74

attatcctag gtcaaagggc agtattcatc cac

33

<210> 75

<211> 339

<212> DNA

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oligonucleotide

<400> 75

caaagggcag	tattcatcca	caattttaaa	agaaaagggg	ggattggggg	gtacagtgca	60
ggggaaagaa	tagtagacat	aatagcaaca	gacatacaaa	ctaaagaatt	acaaaaacaa	120
attacaaaaa	ttcaaaat	tcgggtttat	tacaggggaca	gcagaaatcc	actttggaaa	180
ggaccagcaa	agtcctctg	gaaaggtgaa	ggggcagtag	taatacaaga	taatagtac	240
ataaaagtag	tgccaagaag	aaaagcaaag	atcattaggg	attatggaaa	acagatggca	300
ggtgatgatt	gtgtggcaag	tagacaggat	gaggattag			339

<210> 76

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peptide

<400> 76

Cys	Ile	Gly	Gln	Met	Ala	Val	Phe	Ile	His	Asn	Phe	Lys	Arg	Lys	Gly	1	5	10	15
Gly	Ile	Gly	Gly	Tyr	Ser	Ala	Gly	Glu	Arg	Ile	Val	Asp	Ile	Ile	Ala	20	25	30	
Thr	Asp	Ile	Gln	Thr	Lys	Glu	Leu	Gln	Lys	Gln	Ile	Thr	Lys	Ile	Gln	35	40	45	
Asn	Phe	Arg	Val	Tyr	Tyr	Arg	Asp	Ser	Arg	Asn	Pro	Leu	Trp	Lys	Gly	50	55	60	
Pro	Ala	Lys	Leu	Leu	Trp	Lys	Gly	Glu	Gly	Ala	Val	Val	Ile	Gln	Asp	65	70	75	80
Asn	Ser	Asp	Ile	Lys	Val	Val	Pro	Arg	Arg	Lys	Ala	Lys	Ile	Ile	Arg	85	90	95	
Asp	Tyr	Gly	Lys	Gln	Met	Ala	Gly	Asp	Asp	Cys	Val	Ala	Ser	Arg	Gln	100	105	110	

Asp Glu Asp
115

<210> 77
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 77
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<210> 78
<211> 770
<212> DNA
<213> Artificial Sequence

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oligonucleotide

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aagggcaaaa tgcgacgggt gaagaaagcc ggcgtagtag caaaagaaat agtagccagc 180
tgtgataaat gtcagctaaa aggagaagcc atgcatggac aagtagactg tagtccagga 240
atatggcaac tagattgtac acatttagaa ggaaaagtta tcctggtagc agttcatgta 300
gccagtggat atatagaagc agaagttatt ccagcagaaa cagggcagga aacagcatat 360
ggagcatgca tcaaaccaccg ctacaagcga cgcgatcgtc ggaagcataa agtggcctgc 420
ctagggtcaaa tggcagtatt catccacaat tttaaaagaa aaggggggat tgggggggtac 480
agtgcagggg aaagaatagt agacataata gcaacagaca taaaactaa agaattacaa 540
aaacaaatta caaaaattca aaattttcgg gtttattaca gggacagcag aaatccactt 600
tggaaggac cagcaaagct cctctggaaa ggtgaagggg cagtagtaat acaagataat 660
agtgcataa aagtagtgcc aagaagaaaa gcaaagatca ttagggatta tggaaaacag 720
atggcaggtg atgattgtgt ggcaagtaga caggatgagg attaggatcc 770

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<211> 253
<212> PRT
<213> Artificial Sequence

<220>
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peptide

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His Ser Asn Trp Arg Ala Met Ala Ser Asp Phe Asn Leu Pro Pro Gly
20 25 30

Pro Lys Lys Ala Arg Arg Ile Lys Gly Lys Met Arg Arg Val Lys Lys
 35 40 45
 Ala Gly Val Val Ala Lys Glu Ile Val Ala Ser Cys Asp Lys Cys Gln
 50 55 60
 Leu Lys Gly Glu Ala Met His Gly Gln Val Asp Cys Ser Pro Gly Ile
 65 70 75 80
 Trp Gln Leu Asp Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala
 85 90 95
 Val His Val Ala Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu
 100 105 110
 Thr Gly Gln Glu Thr Ala Tyr Gly Ala Cys Ile Lys His Arg Tyr Lys
 115 120 125
 Arg Arg Asp Arg Arg Lys His Lys Val Ala Cys Ile Gly Gln Met Ala
 130 135 140
 Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser
 145 150 155 160
 Ala Gly Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys
 165 170 175
 Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr
 180 185 190
 Arg Asp Ser Arg Asn Pro Leu Trp Lys Gly Pro Ala Lys Leu Leu Trp
 195 200 205
 Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys Val
 210 215 220
 Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly Lys Gln Met
 225 230 235 240
 Ala Gly Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp
 245 250

<210> 80

<211> 6

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
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<400> 80

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<210> 81
 <211> 232
 <212> PRT
 <213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

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Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys
 20 25 30

Arg Arg Val Val Gln Arg Glu Lys Arg Ala Val Gly Ile Gly Ser Arg
 35 40 45

Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn Asn Leu Leu Arg Ala
 50 55 60

Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys
 65 70 75 80

Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys Asp Gln
 85 90 95

Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys Leu Ile Cys Thr Thr
 100 105 110

Ala Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile
 115 120 125

Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr
 130 135 140

Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn Gln Gln Glu
 145 150 155 160

Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
 165 170 175

Asn Trp Phe Asn Ile Thr Asn Trp Leu Ala Met Glu Lys Tyr Leu Lys
 180 185 190

Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg Gln Val Cys
 195 200 205

His Asp Arg Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu Arg Asp Arg
 210 215 220

Asp Arg Ser Ile Arg Leu Val Asn
 225 230

<210> 82

<211> 254

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

<400> 82

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Met Gly Ser Asp Met Arg Asp Asn Trp Ile Gln Asn Gln Gln Leu Leu
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Asn Leu Trp Gly Cys Lys Gly Arg Leu Val Cys Tyr Thr Asn Trp Arg
          20           25           30

Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile Glu Pro Leu Gly Val
          35           40           45

Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln Arg Glu Lys Arg Ala
          50           55           60

Val Gly Ile Gly Ser Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln
          65           70           75           80

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu
          85           90           95

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu
          100          105          110

Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly
          115          120          125

Lys Leu Ile Cys Thr Thr Ala Val Pro Trp Asn Ala Ser Trp Ser Asn
          130          135          140

Lys Ser Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp
          145          150          155          160

Arg Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu
          165          170          175

Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp
          180          185          190

Lys Trp Ala Ser Leu Trp Asn Trp Phe Asn Ile Thr Asn Trp Leu Ala
          195          200          205

Met Glu Lys Tyr Leu Lys Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys
          210          215          220

Ala Phe Arg Gln Val Cys His Asp Arg Pro Glu Gly Ile Glu Glu Glu
          225          230          235          240

Gly Gly Glu Arg Asp Arg Asp Arg Ser Ile Arg Leu Val Asn
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<210> 83
<211> 297
<212> PRT
<213> Artificial Sequence
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<223> Description of Artificial Sequence: Synthetic peptide

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Arg	Gly	Ala	Val	Gly	Ile	Gly	Ile	Asn	Cys	Thr	Arg	Pro	Asn	Asn	Asn	
			20					25					30			
Thr	Arg	Lys	Ser	Val	Arg	Ile	Gly	Pro	Gly	Gln	Ala	Phe	Tyr	Ala	Thr	
		35					40					45				
Gly	Asp	Ile	Ile	Gly	Asp	Ile	Arg	Gln	Ala	His	Cys	Asn	Ile	Gly	Pro	
	50					55					60					
Thr	Pro	Thr	Gly	Trp	Lys	Lys	Asn	Arg	Arg	Leu	Lys	Gly	Lys	Tyr	Arg	
65					70					75					80	
Arg	Met	Lys	Lys	Trp	Gly	Ala	Val	Gly	Ile	Gly	Ile	Asn	Cys	Thr	Arg	
				85					90					95		
Pro	Asn	Asn	Asn	His	Thr	Arg	Lys	Ser	Ile	His	Ile	Gly	Pro	Gly	Arg	
			100					105					110			
Ala	Phe	Tyr	Ala	Thr	Ser	Gly	Asp	Ile	Ile	Gly	Asp	Ile	Arg	Gln	Ala	
		115					120					125				
His	Cys	Asn	Ile	Gly	Pro	Thr	Pro	Thr	Gly	Ala	Cys	Val	Lys	His	Arg	
	130					135					140					
Gln	Lys	Arg	Lys	Glu	Lys	Arg	Lys	Tyr	Lys	Thr	Ala	Cys	Val	Gly	Ala	
145					150					155					160	
Val	Gly	Ile	Gly	Ile	Asn	Cys	Thr	Arg	Pro	Asn	Asn	Asn	Thr	Arg	Lys	
				165					170					175		
Ser	Ile	His	Leu	Gly	Pro	Gly	Gln	Ala	Phe	Tyr	Ala	Thr	Gly	Asp	Gly	
			180					185					190			
Asp	Ile	Ile	Gly	Asp	Ile	Arg	Gln	Ala	His	Cys	Asn	Ile	Gly	Pro	Thr	
		195					200					205				
Pro	Thr	Gly	Ser	Lys	Lys	Ala	Arg	Arg	Ile	Lys	Gly	Lys	Met	Arg	Arg	
	210					215					220					
Leu	Lys	Lys	Val	Gly	Ala	Val	Gly	Ile	Gly	Ile	Asn	Cys	Thr	Arg	Pro	
225					230					235					240	
Asn	Asn	Asn	Gly	His	Thr	Arg	Lys	Ser	Ile	Arg	Ile	Gly	Pro	Gly	Gln	
				245					250					255		

Thr Phe Tyr Ala Thr Gly Asp Ile Ile Gly Asp Ile Arg Gln Ala His
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Cys Asn Ile Gly Pro Thr Pro Thr Gly Lys Arg Ala Val Lys Ser Arg
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Lys Tyr Lys Arg His Ile Arg Arg Gly
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<210> 84

<211> 221

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 peptide

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Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys
 20 25 30

Arg Arg Val Val Gln Arg Glu Ala Leu Glu Thr Leu Leu Gln Asn Gln
 35 40 45

Gln Ile Leu Asn Leu Trp Gly Cys Lys Gly Arg Leu Ile Cys Tyr Trp
 50 55 60

Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg Tyr Leu
 65 70 75 80

Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys Leu Ile
 85 90 95

Cys Thr Thr Ala Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu
 100 105 110

Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg Glu Ile
 115 120 125

Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser Gln Asn
 130 135 140

Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala
 145 150 155 160

Ser Leu Trp Asn Trp Phe Asn Ile Thr Asn Trp Leu Ala Ile Glu Lys
 165 170 175

Tyr Leu Lys Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg
 180 185 190

Gln Val Cys His Asp Arg Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu
 195 200 205

Arg Asp Arg Asp Arg Ser Ile Arg Leu Val Asn Gly Ser
 210 215 220

<210> 85

<211> 500

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic
 peptide

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
 20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
 35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
 50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
 65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
 85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
 100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly His Ser Asn Gln Val
 115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
 130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
 145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
 165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
 180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
 195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
 210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
 225 230 235 240
 Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
 245 250 255
 Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
 260 265 270
 Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
 275 280 285
 Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
 290 295 300
 Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
 305 310 315 320
 Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
 325 330 335
 Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
 340 345 350
 Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
 355 360 365
 Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
 370 375 380
 Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
 385 390 395 400
 Thr Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
 405 410 415
 Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
 420 425 430
 Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
 435 440 445
 Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
 450 455 460
 Ser Gly Val Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
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 Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
 485 490 495
 Pro Ser Ser Gln
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<210> 86

<211> 696

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 20 25 30
 His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
 35 40 45
 Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
 50 55 60
 Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
 65 70 75 80
 Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
 85 90 95
 Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
 100 105 110
 Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly His Ser Asn Gln Val
 115 120 125
 Ser Gln Asn Tyr Gly Lys Arg Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg
 130 135 140

Xaa Xaa Arg Arg Gly Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg	145	150	155	160
Xaa Arg Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Pro Ile Val Gln Asn	165	170	175	
Ile Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn	180	185	190	
Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile	195	200	205	
Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn	210	215	220	
Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu	225	230	235	240
Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro	245	250	255	
Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly	260	265	270	
Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp	275	280	285	
Gly Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys	290	295	300	
Lys Xaa Gly Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg Xaa Arg	305	310	315	320
Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Met Thr Asn Asn Pro Pro Ile	325	330	335	
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys	340	345	350	
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly	355	360	365	
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu	370	375	380	
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr	385	390	395	400
Leu Leu Val Gly Lys Arg Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa	405	410	415	
Xaa Arg Arg Gly Gly Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa	420	425	430	
Arg Arg Xaa Lys Lys Xaa Gly Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys	435	440	445	

Arg Arg Xaa Arg Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Gln Asn Ala
 450 455 460
 Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr
 465 470 475 480
 Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His
 485 490 495
 Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala
 500 505 510
 Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Ile Val
 515 520 525
 Lys Cys Phe Asn Cys Gly Lys Glu Gly His Thr Ala Arg Asn Cys Arg
 530 535 540
 Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln
 545 550 555 560
 Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp
 565 570 575
 Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu Gln Gly Lys Arg Xaa
 580 585 590
 Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg Arg Gly Gly Xaa Lys
 595 600 605
 Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys Xaa Gly
 610 615 620
 Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg Xaa Arg Arg Lys Xaa
 625 630 635 640
 Lys Xaa Xaa Cys Xaa Gly Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
 645 650 655
 Glu Ser Phe Arg Ser Gly Val Glu Thr Thr Thr Pro Pro Gln Lys Gln
 660 665 670
 Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu
 675 680 685
 Phe Gly Asn Asp Pro Ser Ser Gln
 690 695

<210> 87

<211> 561

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic peptide

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 Met Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile
 20 25 30
 Lys Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly Lys Ile
 35 40 45
 Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile
 50 55 60
 Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu
 65 70 75 80
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 Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Gly Lys Arg
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 Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg Arg Gly Gly Xaa
 65 70 75 80
 Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys Xaa
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 Gly Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg Xaa Arg Arg Lys
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 Xaa Lys Xaa Xaa Cys Xaa Gly Phe Ala Ile Lys Lys Lys Asp Ser Thr
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 145 150 155 160
 Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser
 165 170 175
 Val Pro Leu Asp Glu Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro
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 195 200 205
 Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr
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 Gly Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys
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 Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Gln Met Ala Val Phe Ile His
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 Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly Glu Arg
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 Ile Val Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys Glu Leu Gln Lys
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 Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp Ser Arg
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Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys Val Val Pro Arg Arg
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Lys Leu Thr Pro Leu Cys Val Ser Leu Lys Glu Cys Thr Asp Leu Lys
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Asn Asp Thr Asn Thr Asn Ser Ser Ser Gly Arg Met Ile Met Glu Lys
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 His Gly Ile Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly Ser
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 Leu Ala Glu Glu Glu Val Val Ile Arg Ser Val Asn Phe Thr Asp Asn
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 370 375 380
 Glu Gly Ser Asp Leu Gln Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln
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 Ile Ile Asn Met Trp Gln Lys Val Gly Lys Ala Met Tyr Ala Pro Pro
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Gln Thr Arg Thr Ser Ile Thr Ile Gly Pro Gly Gln Val Phe Tyr Arg
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Tyr Ala Thr Gly Thr Arg Lys Gly Ile His Ile Gly Pro Gly Arg Ala
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Phe Tyr Ala Thr Gly Ser His Gly Thr Glu Lys Leu Trp Val Thr Val
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Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala Thr Thr Thr Leu Phe Cys
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Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys
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Lys Xaa Lys Xaa Xaa Cys Xaa Gly Trp Ala Thr His Ala Cys Val Pro
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 Xaa Arg Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Asn Phe Thr Asp Asn
 1890 1895 1900
 Ala Lys Thr Ile Ile Val Gln Leu Asn Thr Ser Val Glu Ile Asn Cys
 1905 1910 1915 1920
 Thr Arg Pro Asn Asn Asn Thr Arg Lys Arg Ile Arg Ile Gln Arg Gly
 1925 1930 1935
 Pro Gly Arg Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg Gln
 1940 1945 1950
 Ala His Cys Asn Ile Ser Arg Ala Lys Trp Asn Asn Thr Leu Lys Gln
 1955 1960 1965
 Ile Ala Ser Lys Leu Arg Glu Gln Phe Gly Asn Asn Lys Thr Ile Ile
 1970 1975 1980
 Phe Lys Gln Ser Ser Gly Gly Asp Pro Glu Ile Val Thr His Ser Phe
 1985 1990 1995 2000
 Asn Cys Gly Gly Glu Phe Phe Tyr Cys Asn Ser Thr Gln Leu Phe Asn
 2005 2010 2015
 Ser Thr Trp Phe Asn Ser Thr Trp Ser Thr Glu Gly Ser Asn Asn Thr
 2020 2025 2030
 Glu Gly Ser Asp Leu Gln Thr Arg Lys Ser Ile His Ile Gly Pro Gly
 2035 2040 2045
 Gln Ala Phe Tyr Ala Thr Gly Asp Thr Arg Arg Ser Ile Ser Phe Gly
 2050 2055 2060
 Ile Gly Pro Gly Gln Ala Leu Tyr Thr Thr Thr Arg Gln Arg Thr Pro
 2065 2070 2075 2080
 Ile Gly Leu Gly Gln Ala Leu Tyr Thr Thr Gly Gln Phe Arg Thr Val
 2085 2090 2095
 Gln Glu Ile Arg Ile Gly Pro Met Ala Trp Tyr Ser Met Gly Ala Thr
 2100 2105 2110

Met Lys Arg Thr Ser Ile His Ile Gly Pro Gly Gln Thr Phe Tyr Ala
 2115 2120 2125
 Thr Thr Arg Arg Gly Ile Pro Leu Gly Pro Gly Arg Ala Trp Tyr Ala
 2130 2135 2140
 Thr Leu Asp Ser Thr Arg Glu Ser Met Arg Ile Gly Pro Gly Gln Ala
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 Phe Tyr Ala Thr Gly Ile Arg Gln Gly Ile His Ile Gly Pro Gly Arg
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 Ala Trp Tyr Ser Met Gly Ile Cys Thr Arg Arg Gly Ile Arg Met Gly
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 Pro Gly Gln Val Val Tyr Ala Thr Cys Thr Thr Ile Val Gln Ile Lys
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 Ile Ile Gly Pro Leu Ala Val Tyr Ser Met Tyr Gly Thr Arg Lys Ser
 2225 2230 2235 2240
 Val Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala Thr Gly His Thr Arg
 2245 2250 2255
 Lys Ser Ile Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala Thr Asn Thr
 2260 2265 2270
 Arg Gln Ser Thr His Ile Gly Pro Gly Ala Leu Tyr Thr Thr Lys Ile
 2275 2280 2285
 Glu Thr Arg Lys Ser Ile His Leu Gly Pro Gly Gln Ala Phe Tyr Ala
 2290 2295 2300
 Thr Gly Asp Tyr Gln Thr Arg Lys Ser Ile Arg Ile Gly Pro Gly Gln
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 Ala Phe Tyr Ala Thr Gly Asp Thr Val Gln Glu Ile Arg Ile Gly Pro
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 Met Ala Trp Tyr Ser Met Gly Asn Val Thr Arg Ile Ser His Thr Ile
 2340 2345 2350
 Gly Pro Gly Arg Val Phe Tyr Arg Thr Thr Arg Lys Gly Ile His Met
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 Gly Pro Gly Gln Val Leu Tyr Ala Thr Lys Pro His Thr Arg Lys Ser
 2370 2375 2380
 Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr Ser Thr Arg Lys
 2385 2390 2395 2400
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Gln Thr Arg Thr Ser Ile Thr Ile Gly Pro Gly Gln Val Phe Tyr Arg
 2420 2425 2430
 Thr Glu Gly Thr Arg Lys Ser Val Arg Ile Gly Pro Gly Gln Thr Phe
 2435 2440 2445
 Tyr Ala Thr Gly Thr Arg Lys Gly Ile His Ile Gly Pro Gly Arg Ala
 2450 2455 2460
 Phe Tyr Ala Thr Gly Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile
 2465 2470 2475 2480
 Ile Asn Met Trp Gln Lys Val Gly Lys Ala Met Tyr Ala Pro Gly Lys
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 Arg Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg Arg Gly Gly
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 Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys
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 Lys Xaa Lys Xaa Xaa Cys Xaa Gly Pro Ile Ser Gly Gln Ile Arg Cys
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 Ser Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly Asn Ser
 2565 2570 2575
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 2580 2585 2590
 Ser Met Arg Ile Gly Pro Gly Gln Ala Phe Tyr Ala Thr Gly Asp Val
 2595 2600 2605
 Gln Glu Met Arg Ile Gly Pro Met Ala Trp Tyr Ser Met Gly Gln Thr
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 Arg Thr Ser Ile Thr Ile Gly Pro Gly Gln Val Phe Tyr Arg Thr Glu
 2625 2630 2635 2640
 Gly Asp Met Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val
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<212> PRT

<213> Artificial Sequence

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Arg	Arg	Val	Val	Gln	Arg	Glu	Lys	Arg	Ala	Val	Gly	Ile	Gly	Ser	Ala
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Leu	Phe	Leu	Gly	Phe	Leu	Gly	Ala	Ala	Gly	Ser	Thr	Met	Gly	Ala	Ala
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Ser	Met	Thr	Leu	Thr	Val	Gln	Ala	Arg	Gln	Leu	Leu	Ser	Gly	Ile	Val
	65				70					75					80
Gln	Gln	Gln	Asn	Asn	Leu	Leu	Arg	Ala	Ile	Glu	Ala	Gln	Gln	His	Leu
				85					90					95	
Leu	Gln	Leu	Thr	Val	Trp	Gly	Ile	Lys	Gln	Leu	Gln	Ala	Arg	Ile	Leu
			100					105						110	
Ala	Val	Glu	Arg	Tyr	Leu	Lys	Asp	Gln	Gln	Leu	Leu	Gly	Ile	Trp	Gly
		115					120						125		
Cys	Ser	Gly	Lys	Leu	Ile	Cys	Thr	Thr	Ala	Val	Pro	Trp	Asn	Ala	Ser
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Trp	Ser	Asn	Lys	Ser	Leu	Glu	Gln	Ile	Trp	Asn	Asn	Met	Thr	Trp	Met
	145				150					155					160
Glu	Trp	Asp	Arg	Glu	Ile	Asn	Asn	Tyr	Thr	Ser	Leu	Ile	His	Ser	Leu
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Ile	Glu	Glu	Ser	Gln	Asn	Gln	Gln	Glu	Lys	Asn	Glu	Gln	Glu	Leu	Leu
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Glu	Leu	Asp	Lys	Trp	Ala	Ser	Leu	Trp	Asn	Trp	Phe	Asn	Ile	Thr	Asn
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Trp	Leu	Glu	Phe	Asn	Asn	Trp	Tyr	Ile	Lys	Leu	Phe	Ile	Met	Ile	Val
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Gly	Gly	Leu	Val	Gly	Leu	Arg	Ile	Val	Phe	Ala	Val	Leu	Ser	Ile	Val
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Asn	Arg	Val	Arg	Gln	Gly	Tyr	Ser	Pro	Leu	Ser	Phe	Gln	Thr	His	Leu
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Pro	Ile	Pro	Arg	Gly	Pro	Asp	Arg	Pro	Glu	Gly	Ile	Glu	Glu	Glu	Gly
			260					265					270		
Gly	Glu	Arg	Asp	Arg	Asp	Arg	Ser	Ile	Arg	Leu	Val	Asn	Gly	Ser	Leu
		275					280					285			

Ala Leu Ile Trp Asp Asp Leu Arg Ser Leu Cys Leu Phe Ser Tyr His
 290 295 300

Arg Leu Arg Asp Leu Leu Leu Ile Val Thr Arg Ile Val Glu Leu Leu
 305 310 315 320

Gly Arg Arg Gly Trp Glu Ala Leu Lys Tyr Trp Trp Asn Leu Leu Gln
 325 330 335

Tyr Trp Ser Gln Glu Leu Lys Asn Ser Ala Val Ser Leu Leu Asn Ala
 340 345 350

Thr Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu Val Val
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Gly Leu Glu Arg Ile Leu Leu
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Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys Xaa Gly Trp Ile Gln Leu
 35 40 45

Gln Gln Arg Leu Asn Leu Trp Gly Cys Arg Gly Lys Leu Ile Cys Tyr
 50 55 60

Thr Asn Trp Ile Gln Asn Gln Gln Leu Leu Asn Leu Trp Gly Cys Lys
 65 70 75 80

Gly Arg Leu Val Cys Tyr Thr Asn Trp Leu Gln Asn Gln Gln Ile Leu
 85 90 95

Asn Leu Trp Gly Cys Lys Gly Arg Leu Ile Cys Tyr Thr Asn Trp Leu
 100 105 110
 Gln Ser Gln Gln Leu Leu Ser Asn Trp Gly Cys Arg Gly Lys Leu Val
 115 120 125
 Cys Tyr Thr Asn Ala Ile Glu Arg Tyr Leu Gln Asp Gln Ala Arg Leu
 130 135 140
 Asn Ser Trp Gly Cys Thr Phe Arg Gln Val Cys His Ala Met Glu Lys
 145 150 155 160
 Tyr Leu Lys Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg
 165 170 175
 Gln Val Cys His Ala Ile Glu Lys Tyr Leu Lys His Gln Ala Gln Leu
 180 185 190
 Asn Ala Trp Gly Cys Ala Phe Arg Gln Val Cys His Trp Arg Ser Glu
 195 200 205
 Leu Tyr Lys Tyr Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro
 210 215 220
 Thr Lys Ala Lys Arg Arg Val Val Gln Arg Glu Lys Arg Ala Val Gly
 225 230 235 240
 Ile Gly Ser Ala Ile Glu Arg Tyr Leu Gln Asp Gln Ala Arg Leu Asn
 245 250 255
 Ser Trp Gly Cys Thr Phe Arg Gln Val Cys His Ala Met Glu Lys Tyr
 260 265 270
 Leu Arg Asp Gln Ala Ile Val Asn Ser Trp Gly Cys Ala Phe Arg Gln
 275 280 285
 Val Cys Tyr Ala Met Glu Lys Tyr Leu Lys Asp Gln Ala Arg Leu Asn
 290 295 300
 Ser Trp Gly Cys Ala Phe Arg Gln Val Cys His Ala Leu Phe Leu Gly
 305 310 315 320
 Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Met Thr Leu
 325 330 335
 Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn
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 Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr
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 Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Gly Lys Arg Xaa
 370 375 380
 Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg Arg Gly Gly Xaa Lys
 385 390 395 400

Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg Xaa Lys Lys Xaa Gly
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 Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg Xaa Arg Arg Lys Xaa
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 Lys Xaa Xaa Cys Xaa Gly Ala Val Glu Arg Tyr Leu Lys Asp Gln Gln
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 450 455 460
 Val Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser Leu Glu Gln Ile Trp
 465 470 475 480
 Asn Asn Met Thr Trp Met Glu Trp Ile Gln Leu Gln Gln Arg Leu Asn
 485 490 495
 Leu Trp Gly Cys Arg Gly Lys Leu Ile Cys Tyr Thr Asn Trp Leu Gln
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 595 600 605
 Gly Arg Leu Val Cys Tyr Thr Asn Trp Leu Gln Asn Gln Gln Ile Leu
 610 615 620
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 625 630 635 640
 Asn Ile Thr Asn Trp Leu Glu Phe Asn Asn Trp Ile Gln Asn Gln Gln
 645 650 655
 Leu Leu Asn Leu Trp Gly Cys Lys Gly Arg Leu Val Cys Tyr Thr Asn
 660 665 670
 Trp Leu Gln Asn Gln Gln Ile Leu Asn Leu Trp Gly Cys Lys Gly Arg
 675 680 685
 Leu Ile Cys Tyr Thr Asn Trp Leu Gln Ser Gln Gln Leu Leu Ser Asn
 690 695 700

Trp Gly Cys Arg Gly Lys Leu Val Cys Tyr Thr Asn Trp Gly Lys Arg
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 Gly Gly Xaa Cys Xaa Lys Xaa Arg Xaa Lys Arg Arg Xaa Arg Arg Lys
 755 760 765
 Xaa Lys Xaa Xaa Cys Xaa Gly Ala Ile Glu Arg Tyr Leu Gln Asp Gln
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 785 790 795 800
 Met Glu Lys Tyr Leu Arg Asp Gln Ala Ile Val Asn Ser Trp Gly Cys
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 Ala Phe Arg Gln Val Cys Tyr Ala Met Glu Lys Tyr Leu Lys Asp Gln
 820 825 830
 Ala Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg Gln Val Cys His Ala
 835 840 845
 Ile Glu Lys Tyr Leu Lys His Gln Ala Gln Leu Asn Ala Trp Gly Cys
 850 855 860
 Ala Phe Arg Gln Val Cys His Trp Tyr Ile Lys Leu Phe Ile Met Ile
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 Val Gly Gly Leu Val Gly Leu Arg Ile Val Phe Ala Val Leu Ser Ile
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 Val Asn Arg Val Arg Gln Gly Tyr Ser Pro Leu Ser Phe Gln Thr His
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 Glu Lys Tyr Leu Arg Asp Gln Ala Ile Val Asn Ser Trp Gly Cys Ala
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 Phe Arg Gln Val Cys Tyr Ala Met Glu Lys Tyr Leu Lys Asp Gln Ala
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 Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg Gln Val Cys His Gly Ser
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 Leu Ala Leu Ile Trp Asp Asp Leu Arg Ser Leu Cys Leu Phe Ser Tyr
 995 1000 1005

His Arg Leu Arg Asp Leu Leu Leu Ile Val Thr Arg Ile Val Glu Leu
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 Met Glu Lys Tyr Leu Lys Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys
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 Ala Phe Arg Gln Val Cys His Ala Ile Glu Lys Tyr Leu Lys His Gln
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 Ser Ala Val Ser Leu Leu Asn Ala Thr Ala Ile Ala Val Ala Glu Gly
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 Gln Gln Gln Gln Gln Leu Leu Asp Val Val Lys Arg Gln Gln Glu Leu
 50 55 60
 Leu Arg Leu Thr Val Trp Gly Thr Lys Asn Leu Gln Ala Arg Val Thr
 65 70 75 80
 Ala Ile Glu Lys Tyr Leu Gln Asp Gln Ala Arg Leu Asn Ser Trp Gly
 85 90 95
 Cys Ala Phe Arg Gln Val Cys His Thr Thr Val Pro Trp Val Asn Asp
 100 105 110
 Ser Leu Ala Pro Asp Trp Asp Asn Met Thr Trp Gln Glu Trp Glu Lys
 115 120 125
 Gln Val Arg Tyr Leu Glu Ala Asn Ile Ser Lys Ser Leu Glu Gln Ala
 130 135 140
 Gln Ile Gln Gln Glu Lys Asn Met Tyr Glu Leu Gln Lys Leu Asn Ser
 145 150 155 160
 Trp Asp Ile Phe Gly Asn Trp Phe Asp Leu Thr Ser Trp Val Lys Asn
 165 170 175
 Tyr Ile Gln Tyr Gly Val Leu Ile Ile Val Ala Val Ile Ala Leu Arg
 180 185 190
 Ile Val Ile Tyr Val Val Gln Met Leu Ser Arg Leu Arg Lys Gly Tyr
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 Arg Pro Val Phe Ser Ser Pro Pro Gly Tyr Ile Gln Gln Ile His Ile
 210 215 220
 His Lys Asp Arg Gly Gln Ser Pro Ala Asn Glu Glu Thr Glu Glu Asp
 225 230 235 240
 Gly Gly Ser Asn Gly Gly Asp Arg Tyr Trp Pro Trp Pro Ile Ala Tyr
 245 250 255
 Ile His Phe Leu Ile Arg Gln Leu Ile Arg Leu Leu Thr Arg Leu Tyr
 260 265 270
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Ser	Leu	Thr	Val	Ser	Ala	Gln	Ser	Arg	Thr	Leu	Leu	Ala	Gly	Ile	Val
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Gln	Gln	Gln	Gln	Gln	Leu	Leu	Asp	Val	Val	Lys	Arg	Gln	Gln	Glu	Leu
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Leu	Arg	Leu	Thr	Val	Gly	Lys	Arg	Xaa	Xaa	Lys	Xaa	Arg	Lys	Xaa	Lys
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Arg	Xaa	Xaa	Arg	Arg	Gly	Gly	Xaa	Lys	Lys	Xaa	Arg	Arg	Xaa	Lys	Gly
				85					90					95	
Lys	Xaa	Arg	Arg	Xaa	Lys	Lys	Xaa	Gly	Gly	Xaa	Cys	Xaa	Lys	Xaa	Arg
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Xaa	Lys	Arg	Arg	Xaa	Arg	Arg	Lys	Xaa	Lys	Xaa	Xaa	Cys	Xaa	Gly	Trp
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Gly	Thr	Lys	Asn	Leu	Gln	Ala	Arg	Val	Thr	Ala	Ile	Glu	Lys	Tyr	Leu
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Gln	Asp	Gln	Ala	Arg	Leu	Asn	Ser	Trp	Gly	Cys	Ala	Phe	Arg	Gln	Val
145					150					155					160
Cys	His	Thr	Thr	Val	Pro	Trp	Val	Asn	Asp	Ser	Leu	Ala	Pro	Asp	Trp
				165					170					175	
Asp	Asn	Met	Thr	Trp	Gln	Glu	Trp	Glu	Lys	Gln	Val	Arg	Tyr	Leu	Glu
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Asn	Met	Tyr	Glu	Leu	Gln	Lys	Leu	Asn	Ser	Trp	Asp	Ile	Phe	Gly	Asn
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Trp	Phe	Asp	Leu	Thr	Ser	Trp	Val	Lys	Asn	Gly	Lys	Arg	Xaa	Xaa	Lys
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Xaa	Arg	Lys	Xaa	Lys	Arg	Xaa	Xaa	Arg	Arg	Gly	Gly	Xaa	Lys	Lys	Xaa
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Arg	Arg	Xaa	Lys	Gly	Lys	Xaa	Arg	Arg	Xaa	Lys	Lys	Xaa	Gly	Gly	Xaa
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Cys	Xaa	Lys	Xaa	Arg	Xaa	Lys	Arg	Arg	Xaa	Arg	Arg	Lys	Xaa	Lys	Xaa
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Xaa	Cys	Xaa	Gly	Tyr	Ile	Gln	Tyr	Gly	Val	Leu	Ile	Ile	Val	Ala	Val
	290					295					300				

Ile Ala Leu Arg Ile Val Ile Tyr Val Val Gln Met Leu Ser Arg Leu
 305 310 315 320
 Arg Lys Gly Tyr Arg Pro Val Phe Ser Ser Pro Pro Gly Tyr Ile Gln
 325 330 335
 Gln Ile His Ile His Lys Asp Arg Gly Gln Ser Pro Ala Asn Glu Glu
 340 345 350
 Thr Glu Glu Asp Gly Gly Ser Asn Gly Gly Asp Arg Tyr Trp Pro Trp
 355 360 365
 Pro Gly Lys Arg Xaa Xaa Lys Xaa Arg Lys Xaa Lys Arg Xaa Xaa Arg
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 Arg Gly Gly Xaa Lys Lys Xaa Arg Arg Xaa Lys Gly Lys Xaa Arg Arg
 385 390 395 400
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 405 410 415
 Xaa Arg Arg Lys Xaa Lys Xaa Xaa Cys Xaa Gly Ile Ala Tyr Ile His
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 Cys Arg Asp Leu Leu Ser Arg Ser Phe Leu Thr Leu Gln Leu Ile Tyr
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Ser	Glu	Leu	Tyr	Lys	Tyr	Lys	Val	Val	Lys	Ile	Glu	Pro	Leu	Gly	Val
		35					40					45			
Ala	Pro	Thr	Lys	Ala	Lys	Arg	Arg	Val	Val	Gln	Arg	Glu	Lys	Arg	Ala
	50					55					60				
Val	Gly	Ile	Gly	Ser	Arg	Gln	Leu	Leu	Ser	Gly	Ile	Val	Gln	Gln	Gln
65					70					75					80
Asn	Asn	Leu	Leu	Arg	Ala	Ile	Glu	Ala	Gln	Gln	His	Leu	Leu	Gln	Leu
				85					90					95	
Thr	Val	Trp	Gly	Ile	Lys	Gln	Leu	Gln	Ala	Arg	Ile	Leu	Ala	Val	Glu
			100					105					110		
Arg	Tyr	Leu	Lys	Asp	Gln	Gln	Leu	Leu	Gly	Ile	Trp	Gly	Cys	Ser	Gly
		115					120					125			
Lys	Leu	Ile	Cys	Thr	Thr	Ala	Val	Pro	Trp	Asn	Ala	Ser	Trp	Ser	Asn
	130					135					140				
Lys	Ser	Leu	Glu	Gln	Ile	Trp	Asn	Asn	Met	Thr	Trp	Met	Glu	Trp	Asp
145					150					155					160
Arg	Glu	Ile	Asn	Asn	Tyr	Thr	Ser	Leu	Ile	His	Ser	Leu	Ile	Glu	Glu
			165					170						175	
Ser	Gln	Asn	Gln	Gln	Glu	Lys	Asn	Glu	Gln	Glu	Leu	Leu	Glu	Leu	Asp
		180						185					190		
Lys	Trp	Ala	Ser	Leu	Trp	Asn	Trp	Phe	Asn	Ile	Thr	Asn	Trp	Leu	Ala
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Met	Glu	Lys	Tyr	Leu	Lys	Asp	Gln	Ala	Arg	Leu	Asn	Ser	Trp	Gly	Cys
	210					215					220				
Ala	Phe	Arg	Gln	Val	Cys	His	Asp	Arg	Pro	Glu	Gly	Ile	Glu	Glu	Glu
225					230					235					240
Gly	Gly	Glu	Arg	Asp	Arg	Asp	Arg	Ser	Ile	Arg	Leu	Val	Asn	Gly	Ser
			245						250					255	